

CLAIMS

[1] A current limiter circuit in an IC including a power transistor and an output current detection circuit, said current limiter circuit comprising:

a comparator;

a first reference voltage generator circuit; and

a second reference voltage generator circuit,

wherein said output current detection circuit connected in series with said power transistor, said comparator generates a control signal for stopping a drive of said power transistor for a predetermined time according to a detection signal obtained by said output current detection circuit when an output current of said power transistor reaches a predetermined limit value and according to a first reference voltage obtained by said first reference voltage generator circuit, and said comparator generates the control signal according to a detection signal obtained by said output current detection circuit when the output current of said power transistor reaches a predetermined value larger than the predetermined limit value and according to a second reference voltage obtained by said second reference voltage generator circuit, said first reference voltage generator circuit is proved externally of said IC and said second reference voltage generator circuit is included within said IC.

[2] The current limiter circuit as claimed in claim 1, wherein said second reference voltage is set within a range in which said power transistor can continuously operate as a driver.

[3] The current limiter circuit as claimed in claim 2, wherein the output current of said power transistor is

outputted as a drive current of a motor.

[4] The current limiter circuit as claimed in claim 3, wherein the output current of said power transistor is a sink drive current from an output terminal to which the output current of said power transistor is outputted.

[5] The current limiter circuit as claimed in claim 4, wherein the predetermined value is in a range larger than the predetermined limit value by 3% to 10% of the predetermined limit value, said output current detector circuit includes a resistor externally provided through said IC and the detection signal is a terminal voltage generated by said resistor.

[6] The current limiter circuit as claimed in claim 5, further comprising a chopping pulse generator circuit and a timer circuit, wherein the predetermined time period is a constant time period, said timer circuit clocks the constant time period in response to the control signal, said chopping pulse generator circuit generates pulses with an interval of the constant time period set by said timer circuit and said power transistor is ON/OFF controlled according to the pulses.

[7] A motor drive circuit for driving a motor by the output current of said power transistor of said IC including said current limiter circuit claimed in any of claims 1 to 6.

[8] The motor drive circuit as claimed in claim 7, wherein said motor is a stepping motor.